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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,641	04/01/2004	Emanuel Freire Sandes	Q80840	9266

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EXAMINER

BHAT, NINA NMN

ART UNIT	PAPER NUMBER
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1764

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/814,641	Applicant(s) SANDES ET AL.	
	Examiner N. Bhat	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 17-24 and 29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 11-14 is/are rejected.
- 7) ☒ Claim(s) 4-10, 15 and 16 is/are objected to.
- 8) ☒ Claim(s) 1-29 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-16 and 25-28, drawn to a cyclone system, classified in class 422, subclass 147.
 - II. Claims 17-24 and 29, drawn to a process for disengaging solid and gaseous particles in FCC catalytic process, classified in class 208, subclass 168.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process for disengaging catalyst does not require the cyclone arrangement and construction as claimed in the instant claims, for example, the cyclone can included sealed legs which permit the separation of the catalyst particles from the cracked hydrocarbon gas.
3. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.
5. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the

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inventions have acquired a separate status in the art due to their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Mr. Brett Sylvester on April 12, 2007 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-16 and 25-28. Affirmation of this election must be made by applicant in replying to this Office action.

Claims 17-24 and 29 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

8. Action on the merits of claims 1-16 and 25-28 follows:

9. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. Applicant has specifically indicated in the specification that these drawings relate to Brazilian Patents PI 9303773, PI 0002087, PI 0203419-0 all of which were incorporated by reference and constitute prior art. Figure 4, shows applicant's improvement over these Brazilian Patents.

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10. Claims 1-3 and 11-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1, applicant recites "A cyclone system for disengaging solid and gaseous particles in FCC processes..." Applicant is requested to draft the claim to recite "A cyclone system for disengaging solid and gaseous particles which is in association with a FCC reactor". Applicant is further requested to include an element, which corresponds to element 41, in Figure 4, which introduces catalyst and hydrocarbon from the FCC reactor to the disengaging unit. Applicant is required to show all cooperative elements associated with the apparatus. Suitable correction is required. In claims 2, 3 and 11-14, it is unclear what element is meant by "it" in these claims, applicant should point out what element is being referred by "it". Suitable correction is required/.

11. Claims 4-10, 15 and 25-28 are objected as being dependent upon a rejected base claim.

12. Claims 1-16 and 25-28 would be allowable if re-written to overcome the 112, second paragraph rejections and objections because the prior art fails to teach and/or suggest an improved cyclone system for disengaging solids and gases from an FCC reactor which exhibits reduced coke formation in the disengaging vessel, the system includes a legless cyclone fitted with external collector pipes which optimized the purging of gases coming from the disengaging vessel and avoid the release of disengaged catalyst into cyclones in subsequent stages. The system as claimed recites at least one legless cyclone connected to at least one cyclone in consecutive stages through concentric pipes wherein the system has a legless cyclone fitted with at least one collector pipe outside of the cyclone. The closest prior art to applicant's invention is applicant's own Brazilian Patents the deficiencies of each of these references has been fully detailed in the specification. US 6,743,401 which claims priority of Brazilian Patent 002087, teaches using a legless cyclone and includes a flow distributor (9) for equalization of

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flow rates of cyclones in closed cyclone systems installed in the interconnection of the cyclones of the disengager vessel. The distributor of the invention secures a homogeneous accommodation of the gas solids suspension in a connecting pipe. Element 8' in USP'401, is the connector but upon inspection and description given in the specification this connector would not be able to be construed as being "outside the cyclone". 8' as taught in USP'401 is in direct fluid connection with and associated with the cyclone and it has been recognized by applicant that this arrangement provides a large temperature gradient and coking problems exist. The instant invention is an improvement of the prior arts disengaging units by providing a legless cyclone, which is fitted with at least one collector pipe outside the cyclone. The one external collector pipe (43) captures the hydrocarbons coming from the rectifier and most of the steam injected into the disengage in an areas closes to where the catalyst and hydrocarbons from the legless cyclone are discharged thereby preventing the hydrocarbons from circulating in the area of the disengage vessel where the temperature is the lowest thereby preventing coke formation.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fusco et al. teach a system for separating catalyst particles from an FCC reactor including an unconfined cyclone device made up of a diplegless cyclone opening directly into a large volume separator vessel downwardly through a mount and upwardly through the annular space, which corresponds, to Brazil 9393773 discussed in the specification and incorporated by reference. Kam et al. teach a closed FCC cyclone process the cyclones include diplegs. Cetinkaya '498 teach that catalyst is directed downwardly out of the outlet of the disengaging vessel to separate catalyst from the product vapors through a series of dissipater plates that dissipate turbulent flow by eliminating the tangential velocity that would other wise re-entrain the catalyst. Haddad et al. teach a closed cyclone FCC catalyst separator. The cyclones include

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diplegs or risers. Sechrist et al. teach a cyclone provides for cyclone separation enhancement by providing a uni-directional flow of gas from the contaminated gas inlet to the clean gas outlet and discharge opening on the surface of the cyclone body that allow ejection of solid particulates. Chitnis et al. each reduced chaos cyclone separation, which can be used in an FCC regenerator third stage separator. None of these references teach and/or suggest providing in reduced coke formation disengager vessels comprising at least one legless cyclone connected to at least one cyclone in consecutive stages through concentric pipes wherein the system has a legless cyclone fitted with at least one collector pipe outside of the cyclone.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



N. Bhat
Primary Examiner
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